

Trend Study 30-42-03

Study site name: Grapevine Spring.

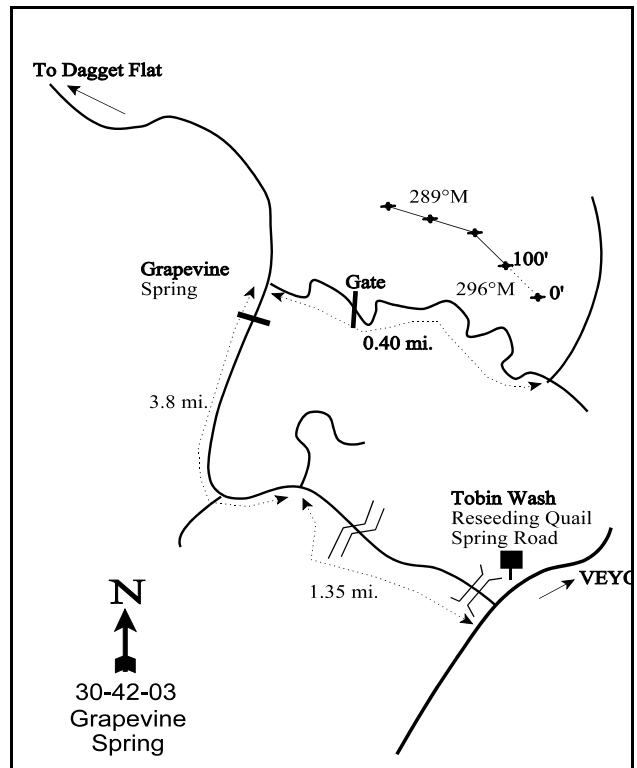
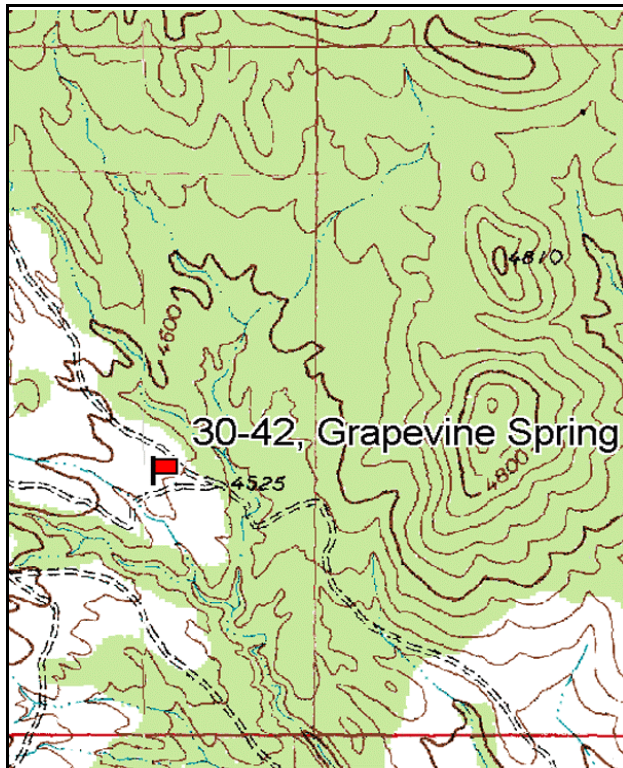
Vegetation type: Mtn. Brush Chaining.

Compass bearing: frequency baseline 296 degrees magnetic. (Lines 3 & 4, 289°M)

Frequency belt placement: line 1 (10 & 92ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). No rebar.

LOCATION DESCRIPTION

From the town of Veyo, proceed west on Gunlock Road 5.7 miles until you come to a sign saying Tobin Wash and with Eagle Mountain Ranch just off the road. Turn right (west) at Eagle Mt. Ranch and travel 1.35 miles on the main road. Turn left, across a small creek, and proceed 3.8 miles to Grapevine Spring. Just past Grapevine Spring, take the fork to the right. Travel 0.40 miles till you come to another fork in the road to the left and stop. From the fork in the road, the 0-foot baseline stake is 10 paces away at a bearing of 296 degrees magnetic. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height. The baseline is marked with browse tag #7098.



Map Name: Gunlock

Diagrammatic Sketch

Township 39S, Range 17W, Section 32

GPS: NAD 27, UTM 12S 4137238 N, 252748 E

DISCUSSION

Grapevine Spring - Trend Study No. 30-42

This trend study is located within critical deer winter range, one-half mile east of Grapevine Spring. The study lies within an old pinyon-juniper chaining that currently supports a mixed browse stand. Elevation is 4,600 feet on a gentle 5%-10% slope and a southeast aspect. Pellet group data from 1998 showed a moderate level of deer use at 32 days use/acre (79 ddu/ha). There were also a few cattle pats encountered (2 cow days use/acre). Pellet group data from 2003 show a similar amount of deer use estimated at 29 days use/acre (73 ddu/ha).

Soils are shallow, moderately rocky, and generally lack effective cover. Effective rooting depth was estimated at 14 inches in 1998. Soil texture is a sandy clay loam which is neutral in reactivity (pH 6.7). Phosphorus is low at just 8.5 ppm, when 10 ppm is considered the minimum value for normal plant development. There is a considerable amount of pavement concentrated on the ground surface in the shrub interspaces. Litter consists largely of dead cheatgrass. Some erosion is occurring, yet it is less severe than on untreated pinyon-juniper woodlands in the immediate area. The gentle, almost flat terrain helps prevent serious soil loss.

The key browse species is mountain big sagebrush with lesser amounts of desert ceanothus and Stansbury cliffrose. The population of big sagebrush has increased from 566 plants/acre in 1982 to 2,432 in 1992 and 4,380 by 1998. Seedling and young plants were numerous and vigor was good. In 2003, density of sagebrush declined by 51%. There were nearly as many dead as live sagebrush. No seedlings were encountered and young plants declined to only 3% of the population.

Desert ceanothus increased 53% in density between 1982 and 1992, but estimates from 1998 are similar to 1982 levels. The population follows the same trend as sagebrush in 2003 with a 50% decline in density. Half of the remaining population is decadent. Stansbury cliffrose occurs in similar densities as desert ceanothus. Utilization has been light to moderate. Other preferred browse species found on the site include a few scattered green ephedra.

The most abundant browse species in 1992 was the increaser broom snakeweed which had expanded from 8,799 plants/acre in 1982 to 11,933 by 1992. Seedlings and young were numerous, characterizing an expanding population at that time. During the 1998 reading, population density actually declined 74% to 3,080 plants/acre. Drought conditions have caused the population to decline even further to only 760 plants/acre by 2003. Surviving pinyon and juniper trees are increasing in size on the site. Point-quarter data from 2003 estimated 52 pinyon and 70 juniper trees/acre. Average basal diameter was estimated at 3.6 inches for pinyon and 4.4 inches for juniper. Average cover doubled between 1998 and 2003. Total line-intercept canopy cover was estimated at 2% for pinyon and 3% for juniper in 2003. Drought has caused many juniper in the area to have brown leaves.

The herbaceous understory is poor producing only 9% cover in 1998 and 4% in 2003. Grass composition consists of both native and seeded species which are not very vigorous and produce little available forage. The principal species, intermediate wheatgrass and bottlebrush squirreltail, had sustained approximately 30% utilization during the 1982 reading. The annual grasses, cheatgrass brome and foxtail brome, are also present and more numerous than the perennial grasses. These annual grasses provided over half of the total grass cover in 1998 and 87% in 2003. Perennial forbs are sparse with relatively few species found more than occasionally. The most abundant species in 1998 was Searls prairie clover which provided 65% of the forb cover but only 4% in 2003. Annual forbs dominated the composition in 2003. Forb utilization has generally been light.

1982 APPARENT TREND ASSESSMENT

Soil condition is poor, but not noticeably declining. There is a lot of bare ground and pavement, yet erosion has been limited somewhat by the gentle slope. Vegetation trend appears to be stable to improving, if one uses the key species as the principal criteria. Mountain big sagebrush appears to be expanding, but so also is broom snakeweed. Other browse species appear relatively static. Perennial herbaceous cover is poor, but could be improved with time and grazing management.

1992 TREND ASSESSMENT

Basal vegetative cover increased from 1% to 3% since the last reading, while bare ground increased by 14%. Litter cover has declined from 60% to 49%. Protective ground cover has declined slightly from 82% to 79%. Trend for soil is considered stable. The browse trend is up due to significant increases in the density and reproductive potentials of key shrub species. However, broom snakeweed is abundant and has also increased. Trend for the herbaceous understory is down with large decreases in quadrat frequencies of both grasses and forbs.

TREND ASSESSMENT

soil - stable (3)

browse - up (5)

herbaceous understory - down (1)

1998 TREND ASSESSMENT

Trend for soil is stable with similar ground cover characteristics compared to 1992. Erosion is still not a serious problem due to the gentle terrain. Trend for browse is up slightly. Mountain big sagebrush appears to be increasing with light to moderate use, good vigor and low decadence. It currently contributes 60% of the browse cover. Desert ceanothus and cliffrose have lower densities compared to 1992, but most of the difference is due to the much larger sample used in 1998. Desert ceanothus displays less heavy use. Both desert ceanothus and cliffrose appear to have stable populations. Trend for the herbaceous understory is up slightly although total production is poor with a total herbaceous cover value of only 9%. Sum of nested frequency for perennial grasses increased slightly, whereas nested frequency for perennial forbs increased elevenfold. Several new forb species were encountered in the larger sample.

TREND ASSESSMENT

soil - stable (3)

browse - up slightly (4)

herbaceous understory - up slightly, but poor (4)

2003 TREND ASSESSMENT

Trend for soil is stable. Cover of bare ground has declined even though vegetative cover has also declined. The ratio of frequency of protective cover to bare ground has remained similar to 1998 levels. There is some erosion occurring yet it is limited by the gentle terrain. Trend for browse is down. Density of the key species, mountain big sagebrush, has declined by 51%. The number of decadent shrubs has increased to 33%, young recruitment is down, and no seedlings were encountered. Dead sagebrush increased from only 180 plants/acre in 1998 to 2,040 in 2003, nearly as numerous as live plants. It is apparent that the drought has caused a significant die-off of sagebrush on this site. Drought has also caused an increase in decadent and dead desert ceanothus plants. Most of the sagebrush are unutilized while use of ceanothus has been mostly light. Cliffrose has maintained good vigor with light to moderate use. Juniper and pinyon trees are slowly increasing in size and provide additional competition for resources. Tree density was estimated at 122 trees/acre with a line-intercept cover value of 5%. Many of the juniper trees in the area displayed brown

leaves due to drought. The herbaceous understory is poor and produces little cover (4%). Trend is down due to a decline in the sum of nested frequency for both grasses and forbs. Only one perennial grass, bottlebrush squirreltail, was encountered on the site in 2003. Annual grasses, foxtail and cheatgrass brome, have also declined in frequency and cover. However, they along with sixweeks fescue, remain the most abundant grasses. The forb composition is diverse but the most common species in 2003 were annuals which provided 72% of the total forb cover. Searls prairie clover, which was the most abundant perennial forb in 1998, declined significantly in nested frequency.

TREND ASSESSMENT

soil - stable (3)

browse - down (1)

herbaceous understory - down and poor (1)

HERBACEOUS TRENDS --

Management unit 30 , Study no: 42

Type	Species	Nested Frequency			Average Cover %	
		'92	'98	'03	'98	'03
G	Agropyron cristatum	-	5	-	.15	-
G	Agropyron intermedium	8	10	-	.07	-
G	Bromus rubens (a)	-	11	7	.37	.20
G	Bromus tectorum (a)	-	_b 121	_a 34	1.02	.72
G	Sitanion hystrix	_b 32	_c 50	_a 3	.96	.03
G	Vulpia octoflora (a)	-	_a 12	_b 25	.02	.11
Total for Annual Grasses		0	144	66	1.42	1.03
Total for Perennial Grasses		40	65	3	1.19	0.02
Total for Grasses		40	209	69	2.62	1.06
F	Agoseris glauca	-	-	1	-	.00
F	Castilleja linariaefolia	-	2	6	.00	.01
F	Calochortus nuttallii	_a -	_b 15	_a 3	.04	.01
F	Cirsium spp.	-	1	3	.00	.00
F	Cordylanthus parviflorus	9	-	-	-	-
F	Dalea searlsiae	_a -	_b 33	_b 18	3.84	.12
F	Descurainia pinnata (a)	-	-	1	-	.00
F	Draba spp. (a)	-	66	78	.48	1.33
F	Erodium cicutarium (a)	-	-	1	-	.15
F	Eriogonum spp.	-	-	4	-	.04
F	Euphorbia spp.	_a -	_b 28	_b 31	.28	.20
F	Frasera albomarginata	_a -	_b 13	_a -	.25	-
F	Gilia spp. (a)	_a -	_a -	_b 12	-	.12
F	Lomatium spp.	-	1	-	.00	-
F	Lotus plebeius	_a 6	_b 34	_a 8	.57	.01

Type	Species	Nested Frequency			Average Cover %	
		'92	'98	'03	'98	'03
F	Microsteris gracilis (a)	-	3	-	.00	-
F	Navarretia intertexta (a)	-	a-	b ³¹	-	.39
F	Penstemon spp.	-	6	11	.06	.05
F	Phlox hoodii	4	9	-	.33	-
F	Sphaeralcea grossulariaefolia	-	-	3	-	.16
F	Unknown forb-annual (a)	-	-	11	-	.04
F	Unknown forb-perennial	-	3	5	.00	.12
F	Viguiera multiflora	-	5	3	.04	.03
Total for Annual Forbs		0	69	134	0.49	2.04
Total for Perennial Forbs		19	150	96	5.45	0.78
Total for Forbs		19	219	230	5.94	2.83

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Management unit 30 , Study no: 42

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Artemisia tridentata vaseyana	82	63	20.35	10.23
B	Ceanothus greggii	9	4	-	1.28
B	Cowania mexicana stansburiana	12	5	3.59	2.09
B	Ephedra viridis	0	0	.15	-
B	Eriodictyon angustifolium	6	7	-	.83
B	Garrya flavescens	2	3	1.00	1.23
B	Gutierrezia sarothrae	45	11	2.53	.23
B	Juniperus osteosperma	3	4	1.75	2.74
B	Opuntia spp.	0	1	-	-
B	Pinus monophylla	1	3	.53	1.84
B	Quercus turbinella	9	5	3.96	7.51
Total for Browse		169	106	33.90	28.02

CANOPY COVER, LINE INTERCEPT --
Management unit 30 , Study no: 42

Species	Percent Cover	
	'98	'03
<i>Artemisia tridentata vaseyana</i>	-	8.48
<i>Ceanothus greggii</i>	-	.83
<i>Cowania mexicana stansburiana</i>	-	3.29
<i>Eriodictyon angustifolium</i>	-	.60
<i>Gutierrezia sarothrae</i>	-	.08
<i>Juniperus osteosperma</i>	2.20	2.76
<i>Pinus monophylla</i>	1.20	2.29
<i>Quercus turbinella</i>	-	8.80

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 30 , Study no: 42

Species	Average leader growth (in)
	'03
<i>Artemisia tridentata vaseyana</i>	1.2
<i>Cowania mexicana stansburiana</i>	1.4

POINT-QUARTER TREE DATA --
Management unit 30 , Study no: 42

Species	Trees per Acre	
	'98	'03
<i>Juniperus osteosperma</i>	54	70
<i>Pinus monophylla</i>	47	52

Average diameter (in)	
'98	'03
3.1	4.4
2.6	3.6

BASIC COVER --
Management unit 30 , Study no: 42

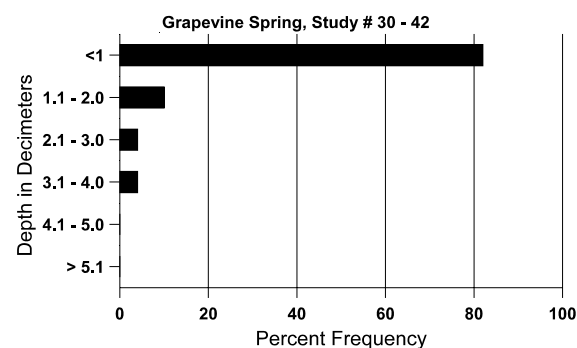
Cover Type	Average Cover %		
	'92	'98	'03
Vegetation	3.00	39.41	31.20
Rock	3.00	7.40	10.19
Pavement	26.00	22.61	18.88
Litter	49.00	45.50	46.26
Cryptogams	0	.05	.18
Bare Ground	21.00	28.76	12.70

SOIL ANALYSIS DATA --

Management unit 30, Study no: 42, Study Name: Grapevine Spring

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
14.3	70.6 (11.3)	6.7	48.0	25.4	26.6	1.8	8.5	108.8	0.6

Stoniness Index



PELLET GROUP DATA --

Management unit 30 , Study no: 42

Type	Quadrat Frequency		Days use per acre (ha)	
	'98	'03	'98	'03
Rabbit	17	7	-	-
Deer	22	18	32 (79)	29 (73)
Cattle	1	-	2 (5)	-

BROWSE CHARACTERISTICS --

Management unit 30 , Study no: 42

		Age class distribution (plants per acre)					Utilization				
Y	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia tridentata vaseyana											
82	566	166	266	300	-	-	0	0	0	0	15/20
92	2432	200	766	1600	66	-	27	1	3	0	26/32
98	4380	1740	760	3520	100	180	27	0	2	2	22/33
03	2160	-	60	1380	720	2040	2	0	33	16	22/29
Ceanothus greggii											
82	233	-	-	233	-	-	0	14	0	0	31/29
92	499	300	166	300	33	-	13	27	7	0	26/40
98	240	20	20	180	40	40	17	0	17	8	27/42
03	120	-	-	60	60	140	17	0	50	33	27/41

		Age class distribution (plants per acre)					Utilization				
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
<i>Chrysothamnus viscidiflorus viscidiflorus</i>											
82	533	-	-	533	-	-	0	0	-	0	11/16
92	0	-	-	-	-	-	0	0	-	0	-/-
98	0	-	-	-	-	20	0	0	-	0	-/-
03	0	-	-	-	-	20	0	0	-	0	-/-
<i>Cowania mexicana stansburiana</i>											
82	99	-	33	66	-	-	0	0	0	0	31/44
92	532	66	333	166	33	-	38	6	6	0	61/66
98	260	60	80	180	-	-	38	0	0	0	58/71
03	120	-	20	100	-	-	50	0	0	0	64/74
<i>Ephedra viridis</i>											
82	0	-	-	-	-	-	0	0	-	0	-/-
92	0	-	-	-	-	-	0	0	-	0	-/-
98	0	-	-	-	-	-	0	0	-	0	29/42
03	0	-	-	-	-	-	0	0	-	0	27/31
<i>Eriodictyon angustifolium</i>											
82	0	-	-	-	-	-	0	0	0	0	-/-
92	66	-	-	66	-	-	0	0	0	0	20/22
98	640	-	20	520	100	-	0	0	16	3	24/16
03	320	-	20	140	160	120	44	13	50	25	17/15
<i>Garrya flavescens</i>											
82	33	-	-	33	-	-	0	0	0	0	24/30
92	33	-	-	33	-	-	0	0	0	0	20/24
98	40	-	-	40	-	-	0	50	0	0	22/31
03	60	-	20	-	40	-	0	0	67	67	-/-
<i>Gutierrezia sarothrae</i>											
82	8799	-	533	8266	-	-	0	0	0	0	12/12
92	11933	2333	900	10000	1033	-	.27	0	9	.55	10/12
98	3080	880	580	2200	300	500	0	1	10	7	8/10
03	760	360	400	360	-	260	0	0	0	0	9/10
<i>Juniperus osteosperma</i>											
82	133	-	33	100	-	-	0	0	-	0	53/43
92	199	33	66	133	-	-	33	0	-	0	73/58
98	60	-	-	60	-	-	0	0	-	0	-/-
03	100	-	40	60	-	20	0	0	-	0	-/-

		Age class distribution (plants per acre)					Utilization				
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Opuntia spp.											
82	0	-	-	-	-	-	0	0	-	0	-/-
92	0	-	-	-	-	-	0	0	-	0	-/-
98	0	-	-	-	-	-	0	0	-	0	6/13
03	20	-	-	20	-	-	0	0	-	0	9/19
Pinus monophylla											
82	0	-	-	-	-	-	0	0	-	0	-/-
92	33	-	33	-	-	-	0	0	-	0	-/-
98	20	-	-	20	-	-	0	0	-	0	-/-
03	60	-	-	60	-	-	0	0	-	0	-/-
Quercus turbinella											
82	33	-	-	33	-	-	0	0	0	0	44/59
92	66	266	-	66	-	-	100	0	0	0	51/49
98	460	60	20	440	-	40	0	0	0	0	55/68
03	100	20	-	80	20	-	0	0	20	0	65/101